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ABSTRACT

Surveys of dental student values are described that were designed to assess value ratings by four dental classes in 1976, annual value ratings of a freshman class as they progressed through their four year program, and the usefulness of the cross-sectional design versus the longitudinal design. Each of the two surveys, which were conducted by the University of Missouri-Kansas City, involved approximately 500 students primarily from the midwestern United States. Using Rokeach's (1967) Value Survey, significant rating differences were found in eight of 36 values tested among the four classes. Five significant terminal values differences among the four classes were: "a comfortable life," "a world at peace," "equality," "pleasure," and "wisdom." Three significant instrumental value results were being: "independent," "helpful," and "obedient." A positive trend appeared between advanced class level and being independent, and negative trends between advanced class level and being helpful and obedient. There were also positive trends between advanced class level and a comfortable life and pleasure; whereas reverse trends emerged between advanced class level. The longitudinal analysis detected four significant, two terminal and two instrumental rating differences. As freshmen advanced in class status, significant rating differences were found for: a comfortable life, pleasure, and being helpful and obedient. The findings indicate that homogeneity of values was found among the four classes (cross-sectional analysis); whereas homogeneity as well as stability of values was found from the longitudinal study. Reasons why the longitudinal data are considered more valid and reliable to the cross-sectional results are examined. A bibliography is included. (SW)

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Cross-Sectional and Longitudinal Surveys of Dental Student Values: Limitations of Cross-sectional Design.

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Cross-sectional and Longitudinal Surveys of Dental Students Values: Limitations of Cross-Sectional Design

Introduction:

Recent cross-sectional surveys of dental student values report conflicting results and conclusions of dental program's impact on student values. In 1976 Loupe, Meskin and Mast (1979) surveyed four dental classes at the University of Minnesota and reported significant class-to-class, freshman through senior, decreases on BENEVOLENCE, one of six values assessed by Gordon's (1976) Survey of Interpersonal Values (1960). Silberman (1976a, 1976b) administered Allport, Vernon and Lindsey's (1970) The Study of Values (1960) to two class levels, freshman and senior, at four northeastern dental schools. No significant differences were found between class levels among six values. Silberman (1976a) concluded that dental education had no apparent impact upon student values; whereas Loupe et al. (1979) concluded otherwise.

These conflicting results and conclusions as well as the negative portrayal of dental students' values during their program provide the context for these University of Missouri-Kansas City (UMKC) surveys which describe and compare: 1. value ratings by four dental classes in 1976; 2. annual value ratings of a freshman class as they progressed through their four year program (1976-1979); and 3. information obtained from two survey methods.

Materials and Methods

Sample

The non-random sample for UMKC surveys were volunteers and residents of Missouri, Kansas, New Mexico, Arkansas, and a few from Hawaii. Each class includes nearly 160 students; a population pool of approximately 640 students located primarily in the midwestern region of the United States.

Actual sample sizes and associated response rates (%) for the cross-sectional survey are depicted in Table 1: 154 Freshman (96.25%); 128 Sophomore (80.00%); 99 Junior (61.88%) and 120 Senior (75.00%). Similar data for the longitudinal study (Table 2) were: identical Freshmen data; 135 Sophomore (84.44%); 129 Junior (80.63%); and 84 Senior (52.50%). Total respondents for the two surveys were 501 and 502 respectively; respective mean response rates were 78.28% and 78.46%. The UMKC response rate range of 52.50% to 96.25% was within those reported in prior surveys. (Table 3) Loupe et al's (1979) response range was 64%-95% and Silberman's (1976a) rate of 40.1% to 92.8%. Discrepancy between respondents and UMKC population pool was due to: refusal to participate; schedule conflicts; illness; absenteeism; and incomplete survey forms.

Instrumentation

Rokeach's (1973) Value Survey (Form D, 1967) differs from prior value instruments and require description. For Rokeach value is:

> "an enduring belief that specific modes of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence." (1973, p. 5)

TABLE 1

CLASS LEVEL, SAMPLE SIZE AND RESPONSE RATE (%) OF UMKC DENTAL CLASSES (CROSS-SECTIONAL, 1976)

CLASS LEVEL	NUMBER	PERCENTAGE
FRESHMAN	154	96.25
SOPHOMORE	128	80.00
JUNIOR	99	61.88
SENIOR	120	75.00
TOTAL	501	$\bar{x}$ = 78.28

TABLE 2

CLASS LEVEL (YEAR), SAMPLE SIZE AND RESPONSE RATE (%), OF A UMKC DENTAL CLASS (LONGITUDINAL, 1976-1979)

CLASS LEVEL (YEAR)	NUMBER	PERCENTAGE
FRESHMAN (1976)	154	96.25
SOPHOMORE (1977)	135	84.44
JUNIOR (1978)	129	80.63
SENIOR (1979)	84	52.50
TOTAL	502	$\bar{x}$ = 78.46

TABLE 3
VALUE SURVEYS: PARTICIPANT RESPONSE RATE (%) RANGES

VALUE SURVEY	RESPONSE RATE (%)	
	LOW	HIGH
LOUPE, MESKIN AND MAST	64.00	95.00
SILBERMAN	40.60	92.80
SAKUMURA	52.50	96.25

After experiments with different formats and value lists Rokeach operationalized his modes of conduct as a set of 18 instrumental values (means) by which persons achieve their end-states of existence (ends) which were operationalized as a set of 18 terminal values. Rokeach assumed that when participants rated these sets of values as being personally or socially preferable compared to an opposite or converse groups of values, they stated their importance level of each value of the two sets. Also, Rokeach presumed that participants' rank ordering of these two sets of 18 values presented their value systems defined as:

> "an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance." (1973, p. 5)

The Value Survey (1967) format includes: a cover page requesting information; a page of brief instructions; a page listing alphabetically 18 terminal values printed on gummed labels permitting each printed value label to be peeled off by participants and rearranged on the basis of importance onto a vertical column of 18 blank numbered boxes (participants can easily change ratings, if desired); and instrumental values in identical format. A defining phrase is printed below each value; to illustrate, A COMFORTABLE LIFE (a prosperous life). Sufficient reliability and validity studies have been conducted (Rokeach, 1973, Homant, 1969, Feather, 1971) to justify usage.

Data Collection Procedures

Four dental classes were surveyed during September 1976 during class periods or orientation sessions. Data collection included: distributing mimeographed sheets which stated the purpose and procedures of the study including the informed consent clause. During distribution, an overlay projected instructions on a screen while statements requested participants to sign the consent form. As students read, heard and agreed to participate, the Value Survey (1967) was distributed. Participants provided information, read the instructions and rearranged the 18 terminal values first and then the instrumental values. After completing their ratings, students were debriefed and dismissed. Data collection was completed within 20 to 25 minutes.

Longitudinal data collection procedures were identical except the consent form was omitted in subsequent sessions. Data was collected during initial class sessions when the entire class period was not required and arrangements had been made previously with the instructors. Similar data collection methods were used in subsequent years until the final session in 1979.

Statistical Analysis

The Extension of the Median test (1956) compared the ratings of each value among class levels. Kendall's TAU (1956) determined the degree of agreement in pairwise comparisons

between classes' value systems. Since 72 null hypotheses were to be tested, alpha level was placed at p = 0.01.

Results

Cross-sectional

Significant rating differences were found in eight of 36 values tested among the four classes*. (Table 4-5) Significant Chi-Square results ranged between 11.93 and 27.35 ($p=0.009$ to $p<0.001$). Five significant terminal values differences among the four classes were: A COMFORTABLE LIFE; A WORLD AT PEACE; EQUALITY; PLEASURE, and WISDOM. Three significant instrumental value results were being: INDEPENDENT; HELPFUL; and OBEDIENT.

These significant findings are portrayed as trends among the four classes. The terminal value (Figure 1) indicated positive trends between advanced class level and A COMFORTABLE LIFE, and PLEASURE; whereas reverse trends emerged between advanced class level and EQUALITY, A WORLD OF PEACE, and WISDOM. The instrumental value (Figure 2) suggests a positive trend between advanced class level and being INDEPENDENT, and negative trends between advanced class level and being HELPFUL and OBEDIENT**.

*Alpha level placed at $p=0.05$ would have included additional five significant results.

**The composite ranks were identical (18); however the medians showed a decreased trend between rating periods.

TABLE 4

TERMINAL VALUE MEDIANS, AND COMPOSITE RANKS FOR PARTICIPANTS:
CROSS-SECTIONAL AND LONGITUDINAL DESIGNS

	SURVEY						
	Cross-Sectional				Longitudinal		
Terminal	Freshman+ (154)	Sophomore (128)	Junior (99)	Senior (120)	Sophomore (135)	Junior (129)	Senior (84)
A Comfortable Life++*	10.50(10)	7.29(8)	7.69(6)	6.10(4)	7.80(7)	7.78(7)	5.70(3)
An Exciting Life	11.25(11)	9.69(11)	11.69(12)	10.38(11)	9.27(10)	9.77(11)	10.28(11)
A Sense of Accomplishment	7.57(6)	6.44(4)	7.71(7)	7.41(7)	7.33(6)	7.15(6)	6.94(7)
A World at Peace++	12.56(12)	14.22(15)	13.13(13)	14.03(15)	13.67(14)	13.58(14)	13.00(13)
A World of Beauty	12.97(14)	13.54(14)	14.29(15)	13.92(14)	13.55(13)	13.85(15)	13.74(15)
Equality++	12.57(13)	14.97(17)	14.46(16)	14.50(16)	13.95(15)	13.91(16)	14.36(17)
Family Security	5.56(2)	5.92(2)	4.05(2)	4.36(1)	5.35(2)	7.00(5)	6.70(5)
Freedom	5.88(5)	6.73(6)	7.08(5)	6.20(5)	6.69(5)	6.78(4)	6.50(4)
Happiness	4.30(1)	4.59(1)	3.00(1)	4.50(2)	4.00(1)	4.18(1)	5.00(1)
Inner Harmony	5.70(3)	6.82(7)	4.80(3)	6.75(6)	5.39(3)	5.55(3)	6.93(6)
Mature Love++	7.63(7)	6.65(5)	8.15(8)	9.00(9)	8.53(4)	8.69(10)	7.36(8)
National Security	15.00(17)	16.00(18)	15.38(18)	14.77(17)	15.60(18)	15.89(18)	15.37(18)
Pleasure++*	13.90(16)	11.21(12)	10.45(11)	9.50(10)	10.78(12)	11.64(12)	10.38(12)
Salvation	13.25(15)	12.25(13)	15.25(17)	15.50(18)	14.08(16)	13.40(13)	14.25(16)
Self-Respect	5.88(4)	6.03(3)	5.63(4)	5.86(3)	5.61(4)	4.41(2)	5.50(2)
Social Recognition	15.50(18)	14.29(16)	13.44(14)	13.44(13)	15.53(17)	14.55(17)	13.64(14)
True Friendship	7.94(8)	7.81(9)	8.67(9)	8.21(8)	8.08(8)	8.36(8)	8.83(9)
Wisdom++	8.56(9)	8.81(10)	9.42(10)	10.67(12)	9.31(11)	8.56(9)	9.17(16)

+Freshman results for Cross-sectional/longitudinal surveys are identical

++Cross-Sectional, $p \leq 0.01$

* Longitudinal, $p \leq 0.01$

TABLE 5

INSTRUMENTAL VALUE MEDIANS, AND COMPOSITE RANKS FOR PARTICIPANTS: CROSS-SECTIONAL AND LONGITUDINAL DESIGNS

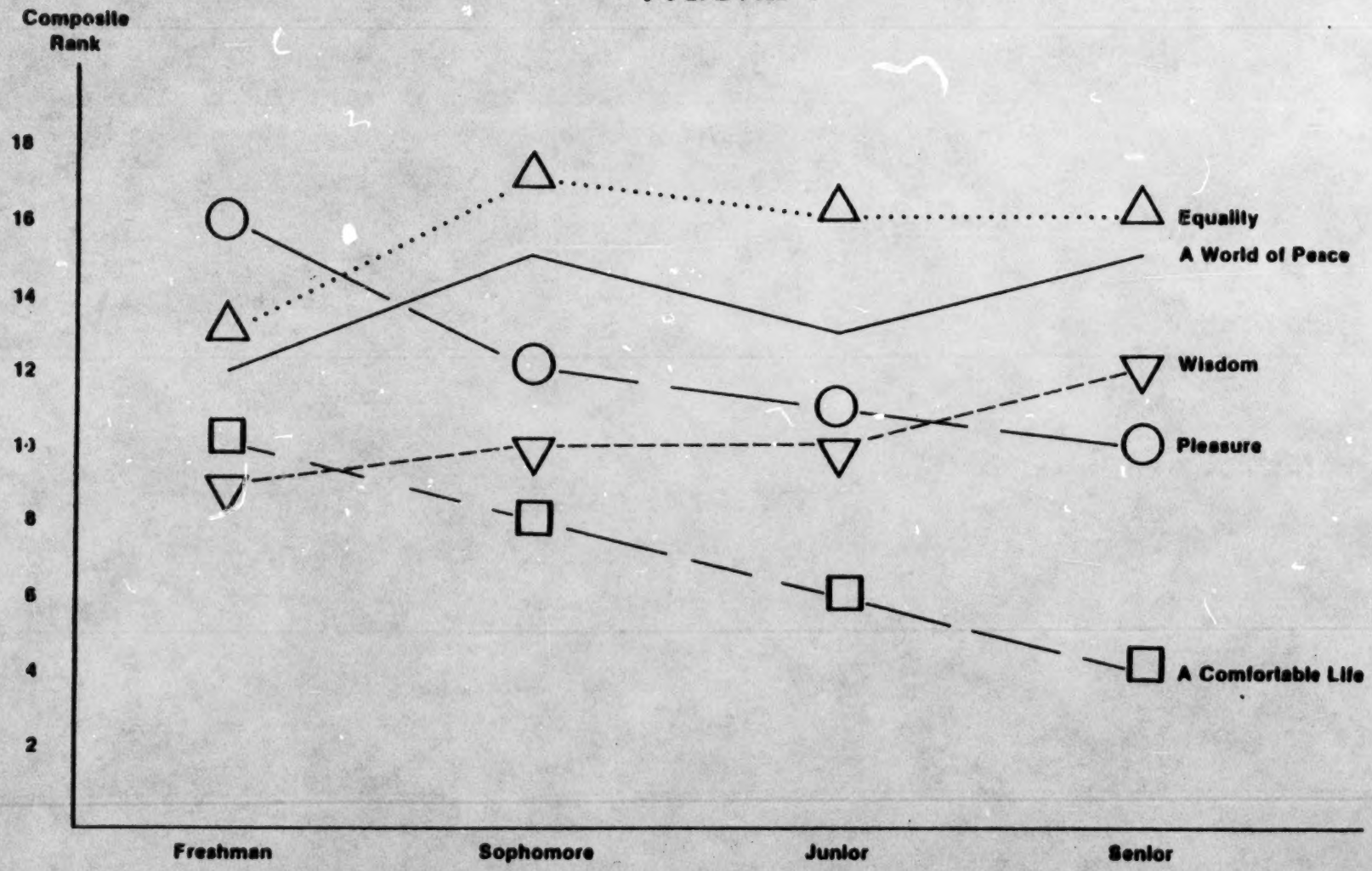
	SURVEY						
	Cross-sectional				Longitudinal		
Instrumental	Freshman+ (154)	Sophomore (128)	Junior (99)	Senior (120)	Sophomore (135)	Junior (129)	Senior (84)
Ambitious	7.00(5)	7.43(6)	7.86(6)	7.42(5)	8.06(6)	7.81(7)	9.50(11)
Broadminded	8.95(8)	9.19(7)	8.22(7)	8.14(7)	8.61(7)	7.78(6)	9.10(8)
Capable	6.33(4)	5.35(2)	6.25(4)	5.60(4)	5.89(3)	6.35(3)	6.00(3)
Cheerful	10.70(12)	9.85(10)	10.29(11)	10.23(10)	11.04(13)	10.39(11)	10.36(13)
Clean	13.21(16)	13.08(17)	13.42(15)	13.38(17)	13.33(16)	13.75(17)	11.93(15)
Courageous	11.30(14)	12.00(15)	11.65(14)	11.58(13)	12.14(14)	11.85(14)	11.67(14)
Forgiving	10.50(10)	11.25(13)	11.15(13)	11.46(14)	10.57(12)	10.71(13)	9.39(10)
Helpful ++*	7.77(7)	9.69(9)	9.45(10)	9.50(9)	9.03(8)	9.55(10)	9.17(9)
Honest	3.81(1)	4.15(1)	3.31(1)	3.32(1)	4.31(1)	4.06(1)	3.75(1)
Imaginative	14.10(17)	11.88(14)	13.45(17)	12.81(16)	13.22(15)	13.36(16)	12.17(16)
Independent++	7.72(6)	6.94(5)	5.32(2)	5.36(3)	7.05(5)	6.81(5)	8.00(6)
Intellectual	10.73(13)	9.22(8)	9.40(9)	10.50(11)	9.45(10)	9.00(9)	7.50(5)
Logical	10.59(11)	10.14(11)	8.71(8)	8.17(8)	9.25(9)	10.42(12)	10.36(12)
Loving	5.75(3)	6.22(4)	6.88(5)	8.00(6)	6.15(4)	6.75(4)	6.50(4)
Obedient ++*	16.17(18)	17.16(18)	17.53(18)	16.86(18)	16.47(18)	17.27(18)	17.61(18)
Polite	12.82(15)	12.27(16)	13.44(16)	12.70(15)	13.39(17)	13.27(15)	12.92(17)
Responsible	4.74(2)	5.95(3)	5.63(3)	5.26(2)	5.16(2)	4.47(2)	5.00(2)
Self-Controlled	9.06(9)	10.56(12)	10.43(12)	10.68(12)	9.78(11)	8.08(8)	8.79(7)

+Freshman results for cross-sectional and Longitudinal surveys are identical

++Cross-sectional, $p<0.01$

*Longitudinal $p<0.01$

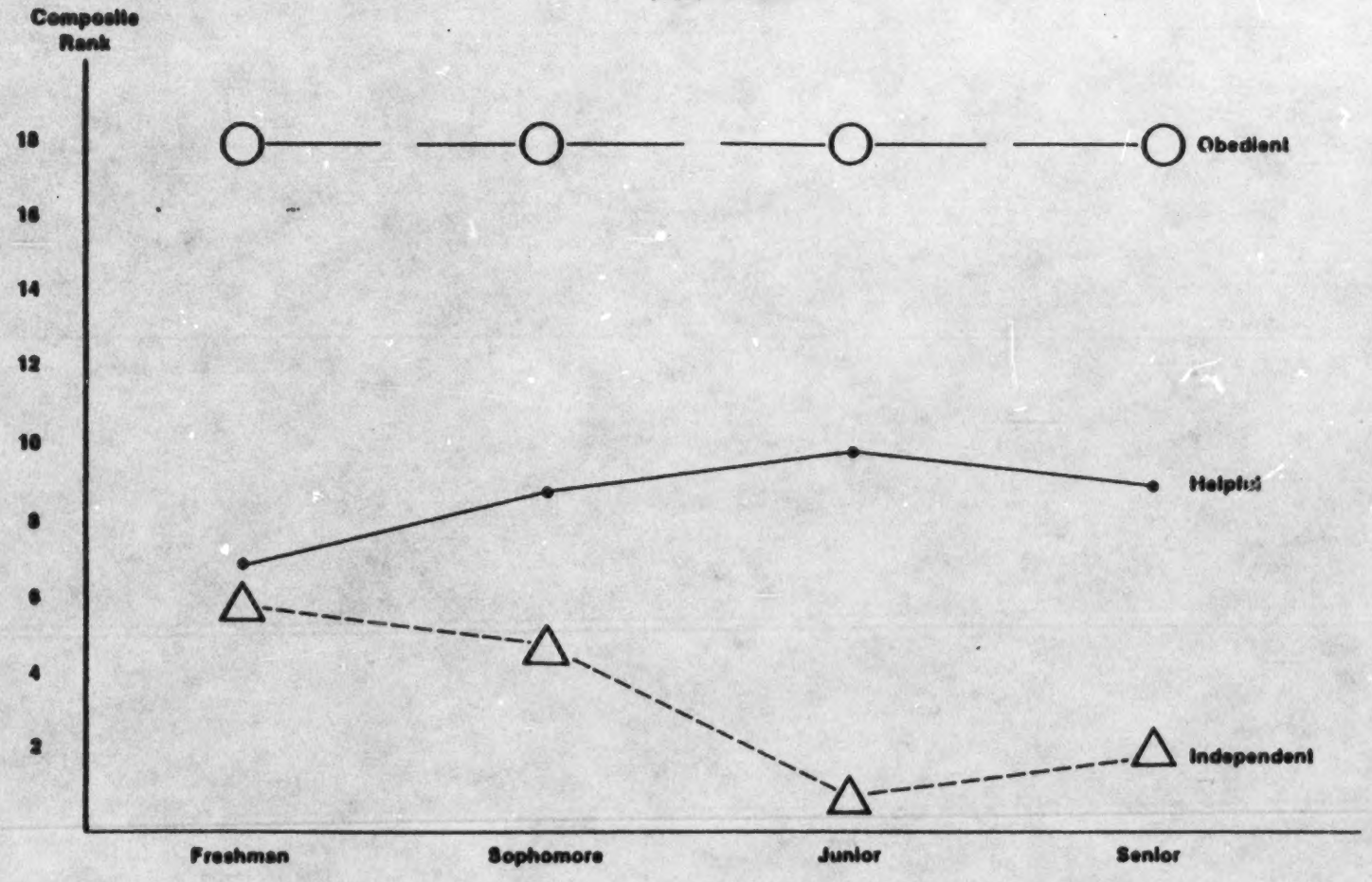
FIGURE 1



CLASS LEVEL

TERMINAL VALUES: COMPOSITE RANKS OF PARTICIPANTS (CROSS-SECTIONAL, 1976)

FIGURE 2



CLASS LEVEL

INSTRUMENTAL VALUES: COMPOSITE RANKS OF PARTICIPANTS (CROSS-SECTIONAL, 1976)

Longitudinal

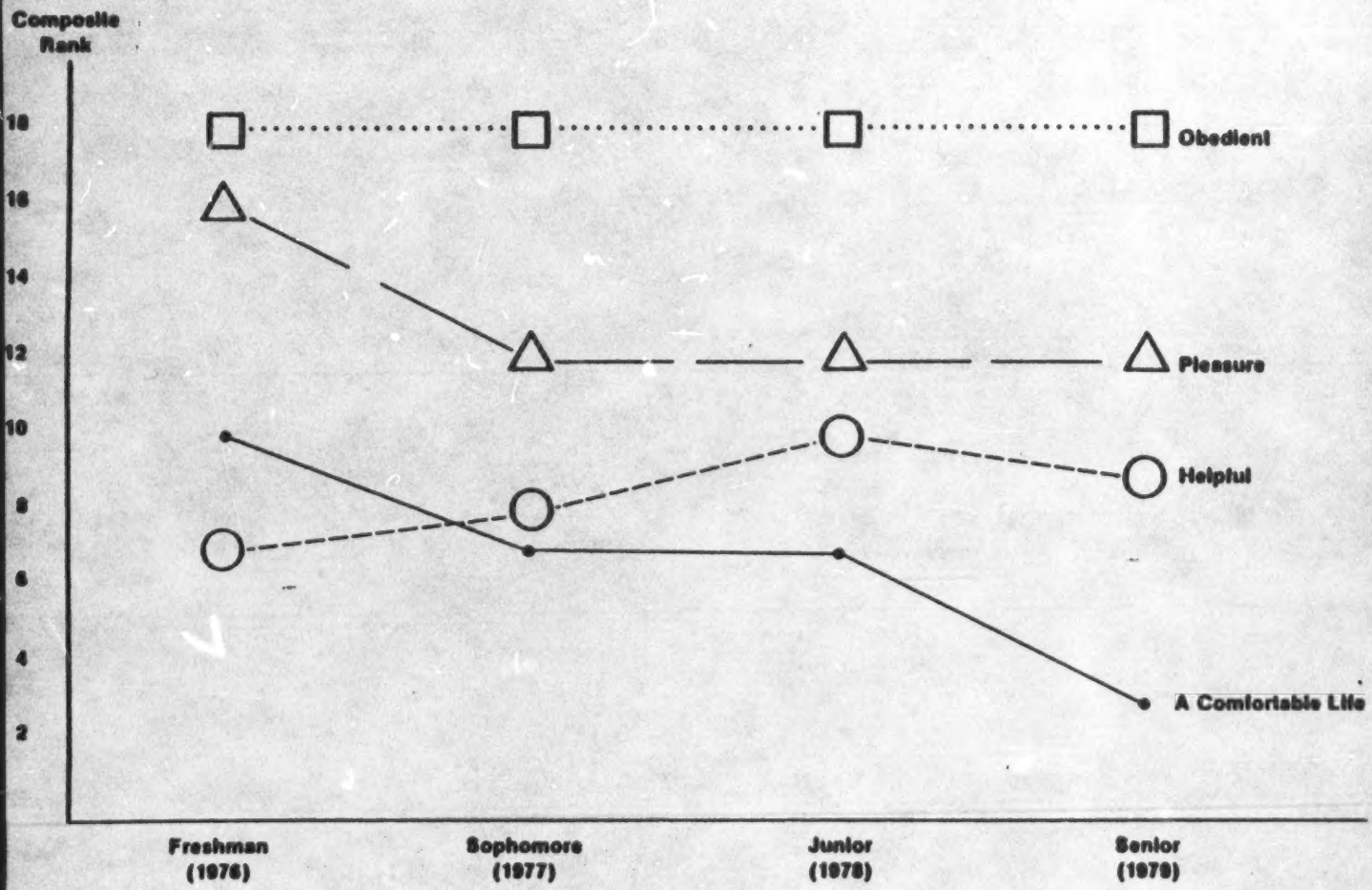
The longitudinal analysis detected four significant, two terminal and two instrumental, rating differences* . As freshmen advanced in class status, significant rating differences were found (Table 4-5): A COMFORTABLE LIFE, PLEASURE and being HELPFUL and OBEDIENT. Figure 3 suggests positive trends between advanced class level and terminal values; whereas reverse trends emerged for instrumental values.

First-Five (Most important) and Last-Five (Least Important) values.

Although significant value rating differences were found cross-sectionally and longitudinally, which values were rated as most and least important by these dental students? Cross-sectional data (Table 6) indicate that among the most important (first-five) terminal values, three were identical: HAPPINESS; FAMILY SECURITY; and SELF-RESPECT. Longitudinal data replicated cross-sectional findings but included FREEDOM. Among the most important (first-five) instrumental values (Table 7) the four classes selected three identical values being: HONEST, CAPABLE, and RESPONSIBLE. Again, longitudinal results were identical except with the addition of LOVING. Among the least important (last-five) terminal value, NATIONAL SECURITY was identical between the two surveys (Table 4). For the cross-section of

*Alpha level placed at p=0.05 would include one additional significant result.

FIGURE 3



CLASS LEVEL

TERMINAL AND INSTRUMENTAL VALUES: COMPOSITE RANKS OF PARTICIPANTS (LONGITUDINAL, 1976-1979)

TABLE 6

FIRST FIVE (MOST IMPORTANT) TERMINAL VALUES OF PARTICIPANTS FROM TWO SURVEYS

SURVEY	COMPOSITE RANK	CLASS LEVEL			
		FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
CROSS-SECTIONAL	1	HAPPINESS	HAPPINESS	HAPPINESS	FAMILY SECURITY
	2	FAMILY SECURITY	SELF-RESPECT	FAMILY SECURITY	HAPPINESS
	3	INNER HARMONY	FAMILY SECURITY	INNER HARMONY	SELF-RESPECT
	4	FREEDOM	A SENSE OF ACCOMPLISHMENT	SELF-RESPECT	A COMFORTABLE LIFE
	5	SELF-RESPECT	MATURE LOVE	FREEDOM	FREEDOM
LONGITUDINAL	1	HAPPINESS	HAPPINESS	HAPPINESS	HAPPINESS
	2	FAMILY SECURITY	FAMILY SECURITY	SELF-RESPECT	SELF-RESPECT
	3	INNER HARMONY	INNER HARMONY	INNER HARMONY	A COMFORTABLE LIFE
	4	FREEDOM	SELF-RESPECT	FREEDOM	FREEDOM
	5	SELF-RESPECT	FREEDOM	FAMILY SECURITY	FAMILY SECURITY

TABLE 7

FIRST FIVE (MOST IMPORTANT) INSTRUMENTAL VALUES OF PARTICIPANTS FROM TWO SURVEYS

SURVEY	CLASS LEVEL				
	COMPOSITE RANK	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
CROSS-SECTIONAL	1	HONEST	HONEST	HONEST	HONEST
	2	RESPONSIBLE	CAPABLE	INDEPENDENT	INDEPENDENT
	3	LOVING	RESPONSIBLE	RESPONSIBLE	RESPONSIBLE
	4	CAPABLE	LOVING	CAPABLE	CAPABLE
	5	AMBITIOUS	INDEPENDENT	LOVING	AMBITIOUS
LONGITUDINAL	1	HONEST	HONEST	HONEST	HONEST
	2	RESPONSIBLE	RESPONSIBLE	RESPONSIBLE	RESPONSIBLE
	3	LOVING	CAPABLE	CAPABLE	CAPABLE
	4	CAPABLE	LOVING	LOVING	LOVING
	5	AMBITIOUS	INDEPENDENT	INDEPENDENT	INTELLECTUAL

dental classes SOCIAL RECOGNITION was identical; whereas A WORLD OF BEAUTY was identical for the longitudinal class (Table 4). Five least important values were identical for both surveys being: OBEDIENT, IMAGINATIVE, CLEAN POLITE and COURAGEOUS (Table 5).

These observations indicate that homogeneity of values were found among the four classes; whereas homogeneity as well as stability of values were found from the longitudinal study. Kendall's TAU (1952) findings corroborate these observations through pairwise comparisons of value systems of the cross-sectional classes and the longitudinal class. TAU (1956) results for terminal value system ranged from 0.74 to 0.87 (Table 8); instrumental value system results ranged from 0.75 to 0.91 (Table 9). Z-scores of these TAU results range between 3.83 to 5.27 ($p<0.0002$).

Survey Design and Finding

Information from the two designs were not identical. First, the cross-sectional design detected twice as many significant value differences compared to the longitudinal design. Second, although significant value rating differences were found, on the one hand, cross-sectional results indicated significant homogeneity of value systems among classes. And on the other hand, longitudinal results found significant homogeneity and stability of value system for this class across their four year program. These significant findings are corroborated by descriptive data of the most and least important values rated by

TABLE 8

KENDALL'S TAU*: PAIRWISE COMPARISONS OF TERMINAL VALUE SYSTEMS OF TWO SURVEYS

SURVEY	CLASS LEVEL	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
CROSS-SECTIONAL	FRESHMAN		.74	.80	.66
	SOPHOMORE			.80	.74
	JUNIOR				.86
	SENIOR				
LONGITUDINAL	FRESHMAN		.84	.77	.73
	SOPHOMORE			.87	.80
	JUNIOR				.83
	SENIOR				

*$p \leq 0.0002$

TABLE 9

KENDALL'S TAU*: PAIRWISE COMPARISONS OF INSTRUMENTAL VALUE SYSTEMS OF TWO SURVEYS

SURVEY	CLASS LEVEL	FRESHMAN	SOPHOMORE	JUNIOR	SENIOR
CROSS-SECTIONAL	FRESHMAN		.77	.79	.80
	SOPHOMORE			.86	.84
	JUNIOR				.97
	SENIOR				
LONGITUDINAL	FRESHMAN		.86	.84	.75
	SOPHOMORE			.87	.82
	JUNIOR				.88
	SENIOR				

*$p \leq 0.0002$

participants. Finally, the longitudinal design provides more reliable and valid data about student value differences or changes as freshman progress through their program. This indicates that investigators conclusions relating to dental programs and student values based primarily upon cross-sectional data seem suspect, if not valid.

Discussion

Several cautions should be cited to clarify UMKC findings relative to prior surveys. First, Rokeach's (1973) conceptualization and development of his value and value system instrumentation differ from its predecessors. To illustrate, the SOV (1960) authors accepted the six values advocated and developed within a European context by Spranger (1928), which values were the basis to prepare items. Rokeach (1973) obtained his value lists from sources common in U.S. Literature (Anderson, 1974) as well as graduate students and 100 Michigan adults.

Second, the Value Survey (1967) assessed 36 values compared to six of prior value instruments, which provided six times more information about the complex and diverse domain of human values. Possibly, the six values of prior instruments were limited and unable to provide adequate information about the human values' domain.

Third, Rokeach (1973) acknowledged that values placed at the extreme end of the rating scale were more stable compared to values placed between the extremes. Thus, values

rated at the extreme negative or positive poles were more strongly held by participants. Finally, terminal values were found to be more stable across time compared to instrumental values.

Comparisons between prior surveys and UMKC cross-sectional studies indicate that the UMKC cross-sectional study supported Loupe et al. (1979) and not those of Silberman (1976a). Loupe et al (1979) found significant decreased class-to-class ratings of BENEVOLENCE, defined as sharing, helping, and being generous with others, and was supported directly and indirectly by UMKC results. Directly, values, classifiable as benevolent or humanitarian, decreased with advanced class level on: EQUALITY (brotherhood, equal opportunity for all), A WORLD AT PEACE (free of war and conflict), WISDOM (a mature understanding of life), and being HELPFUL (working for the welfare of others) and OBEDIENT (dutiful and respectful). Indirect confirmation of this decreased benevolence and humanitarianism was found by increased importance ratings of A COMFORTABLE LIFE (a prosperous life) and PLEASURE (an enjoyable, leisurely life).

The UMKC longitudinal survey partially supported the cross-sectional findings. Longitudinal results found increased importance ratings of A COMFORTABLE LIFE and PLEASURE and decreased ratings of being HELPFUL and OBEDIENT associated with advanced class levels.

Longitudinal data provide more valid and reliable information about value differences of a dental student class during their

program. Compared to longitudinal results, cross-sectional data overestimated by 100% the number of value differences among the four classes. The overestimation is explainable by the greater number of persons and their individual differences included in the cross-section survey (N=501). However, Silberman's (1976a) lack of significant results may be due to sample restrictions, using freshman and seniors only, as well as the SOV (1960) limitations noted elsewhere.

Although longitudinal data are more valid and reliable compared to the cross-sectional results the longitudinal design is not foolproof due to multiple treatment effects (repeated testing) and increased lack of cooperation from participants. Nonetheless, combined cross-sectional and longitudinal survey designs should be encouraged as the norm for social psychological research among dental students.

This latter statement is particularly pertinent to the negative conclusion posited by Fusillo and Metz (1971) after their literature review of dental student value and interest research in the late 1950's and early 1960's:

> "As for the effect of dental schools on the values of students, research has suggested that most United States dental students remain conservative and pragmatic throughout dental school. They became less idealistic, humanitarian and more utilitarian in some instances". (1971, p. 64)

Their strong, negativistic conclusion should be questioned since their basis was primarily cross-sectional surveys and/or studies with freshmen only. In addition, several sources utilized the SOV (1960) whose limitations have been noted.

Both UMKC surveys seem to support a negative, anti-humanitarian image of dental students and the UMKC dental school environment. However, focus on this negative image alone misleads, since preliminary data from UMKC faculty members (n=56) found that their most important terminal and instrumental values were: FAMILY SECURITY, WISDOM, INNER HARMONY, SELF-RESPECT, and A SENSE OF ACCOMPLISHMENT, and being HONEST, CAPABLE, RESPONSIBLE, INDEPENDENT and LOGICAL. In addition, the most important identical values found among the student volunteers portrayed a positive humanitarian image of UMKC dental students. These most important value ratings and their defining phrase were: HAPPINESS (contentedness), FAMILY SECURITY (taking care of loved ones), SELF-RESPECT (self-esteem), FREEDOM (independence, free choice) and being HONEST (sincere, truthful), RESPONSIBLE (dependable, reliable), CAPABLE (competent, effective) and LOVING (affectionate, tender). These values are certainly not anti-benevolent nor anti-humanitarian nor even selfish. Placing selfish and unselfish at opposite ends of a bipolar continuum, UMKC students held values which enable them to become a self or achieve self-realization and seems congruent with Self-Actualization as advocated by Maslow's Theory of Personality (1954). Thus, both positive as well as negative images of dental students were found by these two survey methods.

In summary, the findings indicate that the longitudinal design should be included in cross-sectional studies as normative in future research on values and other social psychological

variables of interest. This strategy should provide more reliable and valid findings of dental students. In addition, both survey designs cannot provide sufficient evidence to assert or extrapolate causal relations between dental school programs and changes in student values, and/or social psychological variables. In addition, a constant, ubiquitous problem in value's research is instrumentation, Rokeach's Value Survey (1967) seems to provide an instrument which obtains sufficient data about the diverse human values domain. However, future research may require development of additional instruments and designs which may allow causal statements. Currently, our knowledge about the values of dental students, impact of the dental school upon students and dental practitioners remains minimal. Nonetheless, attention and research into values should continue, since human personal values impinge upon professional ethics, accountability, quality assurance of oral health care and delivery of oral health care to U.S. citizens not as a privilege but as a right. Possibly, the next step in the value's research agenda is systematic investigation of values among dental practitioners.

Conclusions: within the limitations of this study the following is presented:

1. Four dental classes rated eight of 36 values as significantly different: A COMFORTABLE LIFE; A WORLD OF PEACE; EQUALITY; PLEASURE; WISDOM; and being HELPFUL; INDEPENDENT; OBEDIENT.
2. Longitudinal freshman class across their program rated significantly different the values: A COMFORTABLE LIFE; PLEASURE; and being HELPFUL; OBEDIENT.
3. Terminal and instrumental value systems between cross-sectional and longitudinal groups were significantly associated.
4. Cross-sectional design overestimated the number of significant results compared to the longitudinal design.
5. Observations of the most important values selected by students provided a positive, humanitarian image of Self-Actualization among dental students.

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